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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/577,808	04/28/2006	Goshiki Keigo	F260	8045

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EXAMINER	
NGUYEN, VU ANH	
ART UNIT	PAPER NUMBER
1796	

MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/577,808	KEIGO, GOSHIKI	
	Examiner	Art Unit	
	Vu Nguyen	1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. Acknowledgement is made of applicant's amendment, filed 01/30/2009, wherein claims 3, 5 and 6 have been amended and new claims 7-13 have been added. Claims 1-13 are pending in this application.

Specification

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Objections

3. Claims 4, 7 and 9-13 are objected to because of the following informalities: The following terms are mis-spelled: in claim 4, line 3, first term; in claim 7, line 3, the sulfonic acid term; in claim 9, part (d), the term carbon; in claim 10, line 3, the second term; in claim 11, line 4; in claim 12, line 2, the term nanotube, and line 3, the sulfonic acid term; and in claim 13, 3rd-from-last line, the term carbon.

4. Claim 12 is objected to because of the following informalities: improper Markush group recitation. Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 9-13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. These claims involve blend composition(s) wherein a terminal-stabilized fluororesin is in contact with a fluorosurfactant to form a fluororesin component of the blend composition(s), said fluororesin component is subsequently blended with fluorosurfactant-treated carbon nanotubes. In the disclosure, there is no support for such process.

8. Claims 9-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 9, part (d) recites "...mixed with said carbon nanotube". Since part (c) has carbon nanotube and carbon nanotube component, it is not clear whether the carbon nanotube in part (d) refers to the (unmodified) carbon nanotube or the (modified) carbon nanotube component in part (c).

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

10. Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being anticipated by Miyagawa (JP 2003/192914A) for the reasons set forth in the Office action dated 07/30/2008.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

12. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

13. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa (JP 2003/192914A) in view of Nishikawa et al. (JP 2000/281855A) for the reasons set forth in the Office action dated 07/30/2008.

14. Claims 4-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Miyagawa (JP 2003/192914A) in view of Nishikawa et al. (JP 2000/281855A), Barraza et al. (WO 2004/001107), and Khan et al. (U.S. 4,469,846).

15. Regarding the limitations set forth in these claims, Miyagawa teaches, as mentioned above, a composition comprising a fluororesin and carbon nanotubes. The fluororesin includes a tetrafluoroethylene-hexafluoropropylene copolymer. The obvious reasons for one skilled in the art to modify the disclosed composition by surface-treatment of the carbon nanotubes with fluoroalkyl compounds as taught by Nishikawa are discussed above. However, neither Miyagawa nor Nishikawa teaches the fluorosurfactants recited in these claims.

16. Barraza et al. (Barraza, hereafter) teaches a carbon nanotube-filled composite comprising the steps of dispersing the carbon nanotubes with a surfactant in an aqueous medium, adding polymerizable monomers, adding initiator, and conducting polymerization (Claim 1). The monomers include styrene and the surfactants include sodium dodecyl sulfate, sodium dodecylbenzene sulfonate, and others (Claim 9). Barraza is concerned with the question of how to adequately disperse carbon nanotubes in a polymer matrix without destroying their integrity [0002] and the disclosed

method enables the carbon nanotubes to be highly dispersed in the polymer matrix [0004].

17. Khan et al. (Khan, hereafter) teaches core/shell fluoropolymer compositions wherein both the core and the shell are made of fluorinated monomers (col. 2, lines 19-30). The core comprises a homopolymer of tetrafluoroethylene synthesized in aqueous emulsion using emulsifying agents that include perfluoroalkylcarboxylic acid, fluoroalkylsulfonic acid, or there salts (col. 2, lines 56-67). The core/shell fluoropolymer compositions are used as fillers for fluoroelastomers, together with other conventional fillers, to impart improved tear strength and other physical properties (col. 4, lines 66-68; col. 5, lines 1-20; Abstract).

18. The examiner notes that, as taught by Nishikawa and Barraza, carbon nanotubes can be dispersed with either a nonionic surfactant or an ionic surfactant, depending on the chosen methods (e.g., non-aqueous or aqueous medium). It is also noted that anionic surfactants such as alkylsulfonic acid, alkylcarboxylic acid, and their salts are well known surfactants used for dispersing a hydrophobic component, which can be carbon nanotubes as disclosed by Barraza, in an aqueous medium. Further, one skilled in the art would know that "like dissolves like". In other words, one would want to blend a fluorinated component in a fluorinated matrix (as in the cases of Nishikawa and Khan) and a non-fluorinated component in a non-fluorinated matrix (as in the case of Barraza); otherwise, the blends will be unstable due to phase separation.

19. For the aforesaid reasons and in light of the teachings by Barraza that anionic surfactants such as alkylsulfonate salts are highly suitable for dispersing carbon

nanotubes, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the composition taught by Miyagawa by employing fluoroalkylcarboxylic acid, fluoroalkylsulfonic acid, or their salts as surfactants for dispersing the carbon nanotubes (in aqueous medium) and incorporating the so-dispersed carbon nanotubes in the fluorinated polymer matrix so as to achieve more uniform dispersion of the filler in the fluororesin with minimum phase separation and thereby improve the performance of the composition.

Response to Arguments

20. Applicant's arguments filed 01/30/2009 have been fully considered but they are not persuasive. First, even though the previous rejection of claim 6 under 35 U.S.C. 112 (2nd) has been withdrawn due to the amendment, it is noteworthy to point out that said rejection was for lack of antecedent basis in the claim(s) on which claim 6 depends, not for lack of support from the specification as alleged by the applicant (Remarks, p. 2, 1st paragraph). Second, applicant alleges that, with respect to the rejection of claims 1 and 2 under 35 U.S.C. 102(b) as set forth above, Miyagawa does not teach fluororesin having stabilized terminals (Remarks, p. 4). As discussed in the Office action, according to the definition of stabilized terminals given by the applicant in the disclosure, the fluororesin of the prior art inherently possesses stabilized terminals. Third, with respect to the rejection of claim 3, the applicant alleges that none of the references teaches "the details of coating both the carbon nanotubes and the fluororesin" and that Nishikawa does not teach an "increase in affinity" when fluorosurfactant-treated carbon nanotubes

and blended with a fluororesin (Remarks, p. 5, 1st paragraph). The "coating both the carbon nanotubes and the fluororesin" is irrelevant as such limitation is absent from the instant disclosure. As to the "increase in affinity," Nishikawa discloses that if the filler is not surface-treated with a fluoroalkyl compound or if it is surface-treated with a fluorine-free compound, the dispersibility of the filler will be inferior [0012] and the conductivity of the composition will be negatively impacted from fluctuation of resistance [0001]. Further, one of ordinary skill in the art would realize, from basic chemistry, that fluorosurfactant has good affinity toward a fluororesin because "like dissolves like." Also in regard to the rejection of claim 3, applicant alleges that Nishikawa does not teach carbon nanotubes and that carbon nanotubes are not a species of graphitic carbon genus (p. 5, last paragraph). It is well known that carbon nanotubes, unless specified otherwise, are graphitic in nature. Finally, applicant's arguments with respect to the rejection of claims 4-6 (above) are not persuasive due to the following reasons. Applicant alleges that "[t]he Examiner maintains that in a water environment of the emulsion polymerization of the fluororesin the surfactant used for the polymerization also acts to disperse the carbon nanotubes in the fluororesin." (p. 6, 3rd paragraph). As discussed in paragraphs 15-19 above, the examiner shows that, from the teachings of the prior art references, one of ordinary skill in the art would be motivated to employ the fluorosurfactants to disperse (or modify the surface of) the carbon nanotubes, wherein such dispersion/surface treatment step can be done in an aqueous medium, then blend the resulting (modified) carbon nanotubes with the fluororesin. The examiner never maintains that said blending step is to be done in an aqueous medium. In response to

applicant's arguments against the references individually (p. 7), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.,* 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Conclusion

21. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vu Nguyen whose telephone number is (571)270-5454. The examiner can normally be reached on M-F 7:30-5:00 (Alternating Friday Off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Wu can be reached on 571-272-1114. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Vu Nguyen
Examiner
Art Unit 1796

/David Wu/
Supervisory Patent Examiner, Art Unit 1796